



Apr 17th, 9:00 AM - 10:00 AM

# Products of the Photolysis of Nitrous Acid in a Benzene Matrix

Ethan Schrum

*Illinois Wesleyan University*

Timothy Rettich, Faculty Advisor

*Illinois Wesleyan University*

Follow this and additional works at: <http://digitalcommons.iwu.edu/jwprc>

Ethan Schrum and Timothy Rettich, Faculty Advisor, "Products of the Photolysis of Nitrous Acid in a Benzene Matrix" (April 17, 1999). *John Wesley Powell Student Research Conference*. Paper 4.  
<http://digitalcommons.iwu.edu/jwprc/1999/posters/4>

This Event is brought to you for free and open access by The Ames Library, the Andrew W. Mellon Center for Curricular and Faculty Development, the Office of the Provost and the Office of the President. It has been accepted for inclusion in Digital Commons @ IWU by the faculty at Illinois Wesleyan University. For more information, please contact [digitalcommons@iwu.edu](mailto:digitalcommons@iwu.edu).

©Copyright is owned by the author of this document.

Poster Presentation 33

**PRODUCTS OF THE PHOTOLYSIS OF NITROUS ACID  
IN A BENZENE MATRIX**

Ethan Schrum and Timothy Rettich\*

Department of Chemistry, Illinois Wesleyan University

The photodegradation of nitrous acid in the troposphere is an initiation step in the formation of photochemical smog. NO<sub>x</sub> emissions from internal combustion engines react with atmospheric water vapor during sundown hours to form nitrous acid. Daytime sunlight cleaves nitrous acid into OH and NO radicals, which attack hydrocarbons emitted by industry to form the constituents of photochemical smog. In order to model this process, aqueous nitrous acid was extracted into a liquid benzene matrix to form a clear solution, which was photolyzed with 365 nm radiation. The photolysis generated a yellow liquid phase and a deep red precipitate. The liquid phase products have been identified by GC-MS and HPLC analysis as p-benzoquinone, phenol, nitrobenzene, o, m, and p-nitrophenol, 1,2, 1,3, and 1,4-dinitrobenzene, 2,4-dinitrophenol, biphenyl, and 2,3, and 4-nitrobiphenyl. The red precipitate is insoluble in benzene and ether but soluble in water, methanol and acetone. <sup>13</sup>C-NMR spectroscopy has been inconclusive in identification of the red precipitate.